AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

Claims 1-19 (canceled).

Claim 20 (new): A switching power supply apparatus comprising:

a first switch circuit S1 including a parallel connection circuit having a first switch device Q1, a first diode D1, and a first capacitor Cds1;

a second switch circuit S2 including a parallel connection circuit having a second switch device Q2, a second diode D2, and a second capacitor Cds2;

an input-side rectifying circuit Da including at least one rectifying device for rectifying an AC input voltage;

a third capacitor Ca to which the voltage rectified by the rectifying circuit Da is applied;

a transformer T having a primary winding Lp and a secondary winding Ls;

a rectifying and smoothing circuit RS connected to the secondary winding Ls;

a first inductor Lr connected in series with the primary winding Lp;

a second inductor Li connected so that a voltage of the third capacitor Ca is applied during an on-period for which the first switch circuit S1 conducts;

a third diode Di preventing a reverse current from flowing in the second inductor Li;

a fourth capacitor Ci that is charged by excitation energy stored in the second inductor Li and that is connected so as to apply a voltage to the primary winding Lp during the on-period;

a fifth capacitor Cr defining a closed loop together with the first inductor Lr, the primary winding Lp, and the second switch circuit S2; and

switching control circuits SC1 and SC2 arranged to alternately turn on and off the first and second switch devices with a period of time during which both switch devices are turned off therebetween.

Claim 21 (new): The switching power supply apparatus according to Claim 20, wherein a second transformer T2 that is different from the transformer T is provided, the second inductor Li includes an input winding of the second transformer T2, and a rectifying circuit Ds2 is provided between an output winding Lo of the second transformer T2 and the rectifying and smoothing circuit RS.

Claim 22 (new): The switching power supply apparatus according to Claim 20, wherein a second transformer T2 that is different from the transformer T is provided, an input winding Li1 of the second transformer T2 is connected in series with the second inductor Li, and a rectifying circuit Ds2 is provided between an output winding Lo of the second transformer T2 and the rectifying and smoothing circuit RS.

Claim 23 (new): The switching power supply apparatus according to Claim 20, wherein the transformer T has a tertiary winding Lt, and the second inductor Li is connected in series with the tertiary winding Lt.

Claim 24 (new): The switching power supply apparatus according to Claim 20, wherein the third capacitor Ca is arranged to cause a harmonic component current to flow, and defines a low-pass filter or a portion of the low-pass filter.

Claim 25 (new): The switching power supply apparatus according to Claim 20, wherein a fourth diode Db is connected between the input-side rectifying circuit Da and the fourth capacitor Ci.

Claim 26 (new): The switching power supply apparatus according to Claim 20, wherein a first end of the second inductor Li is connected to a node between the first

switch circuit S1 and the second switch circuit S2 and a second end of the second inductor Li is connected to the third diode Di, and both ends of the fourth diode Dc are connected to a node between the second switch circuit S2 and the fifth capacitor Cr and the node between the first switch circuit S1 and the second switch circuit S2.

Claim 27 (new): The switching power supply apparatus according to Claim 20, wherein the transformer T includes a plurality of drive windings Lb1 and Lb2, and the switching control circuits SC1 and SC2 drive the first switch device Q1 or the second switch device Q2 using a voltage generated in the drive windings Lb1 and Lb2.

Claim 28 (new): The switching power supply apparatus according to Claim 20, wherein delay circuits DL1 and DL2 including series circuits having resistors Rg1 and Rg2 and capacitors Cg1 and Cg2 are provided between the drive windings Lb1 and Lb2 and control terminals of the first and second switching devices Q1 and Q2, and the switching control circuits SC1 and SC2 turn on the switch devices Q1 and Q2 with a delay after voltages for turning on the switch devices Q1 and Q2 are generated in the drive windings Lb1 and Lb2, respectively.

Claim 29 (new): The switching power supply apparatus according to Claim 28, wherein delay times of the delay circuits DL1 and DL2 are set so that the switch devices Q1 and Q2 are not turned on until the voltages to be applied to both ends of the first and second switch devices Q1 and Q2 are reduced to zero or about zero.

Claim 30 (new): The switching power supply apparatus according to Claim 20, wherein the switching control circuits SC1 and SC2 include a switch device connected to control terminals of the switch devices Q1 and Q2, the switch device being turned on a predetermined time after voltages for turning on the switch devices Q1 and Q2 are generated in the drive windings Lb1 and Lb2, thereby turning off the switch devices Q1 and Q2.

Claim 31 (new): The switching power supply apparatus according to Claim 30, wherein the switch device includes transistors Tr1 and Tr2, and impedance circuits and capacitors Ct1 and Ct2 defining time constant circuits are connected to control terminals of the transistors Tr1 and Tr2, respectively.

Claim 32 (new): The switching power supply apparatus according to Claim 20, wherein the switching control circuits SC1 and SC2 include time constant circuits TC1 and TC2 for turning off the switch devices Q1 and Q2 a certain time after voltages for turning on the switch devices Q1 and Q2a are generated in the drive windings Lb1 and Lb2.

Claim 33 (new): The switching power supply apparatus according to Claim 20, wherein the transformer T has a leakage inductance, and the leakage inductance defines the first inductor Lr.

Claim 34 (new): The switching power supply apparatus according to Claim 20, wherein at least one of the first switch circuit S1 and the second switch circuit S2 includes a field-effect transistor.

Claim 35 (new): The switching power supply apparatus according to Claim 20, wherein the switching control circuits SC1 and SC2 control the on-period of the first switch device Q1 so as to stabilize an output voltage obtained from the rectifying and smoothing circuit RS connected to the secondary winding Ls.

Claim 36 (new): The switching power supply apparatus according to Claim 20, wherein the switching control circuits SC1 and SC2 control the on-period of the second switch device Q2 depending upon the voltage across the fourth capacitor Ci.

Claim 37 (new): The switching power supply apparatus according to Claim 20, wherein the switching control circuits SC1 and SC2 suppress the on-period of the

second switch device Q2 as the voltage across the fourth capacitor Ci increases, and, transition to an intermittent oscillation operation mode in which an oscillation period and a stop period are periodically repeated under a light load or no load, the switching control circuits SC1 and SC2 suppress an increase of the voltage across the fourth capacitor Ci.

Claim 38 (new): A switching power supply apparatus comprising:

a first switch circuit S1 including a parallel connection circuit having a first switch device Q1, a first diode D1, and a first capacitor Cds1;

a second switch circuit S2 including a parallel connection circuit having a second switch device Q2, a second diode D2, and a second capacitor Cds2;

an input-side rectifying circuit Da including at least one rectifying device for rectifying an AC input voltage;

a third capacitor Ca to which the voltage rectified by the rectifying circuit Da is applied;

a transformer T having a primary winding Lp and a secondary winding Ls;

a rectifying and smoothing circuit RS connected to the secondary winding Ls;

a first inductor Lr connected in series with the primary winding Lp;

a second inductor Li connected so that a voltage of the third capacitor Ca is applied during an on-period for which the first switch circuit S1 conducts;

a third diode Di preventing a reverse current from flowing in the second inductor Li;

a fourth capacitor Ci that is charged by excitation energy stored in the second inductor Li and that is connected so as to apply a voltage to the primary winding Lp during the on-period;

a fifth capacitor Cr defining, together with the second switch circuit S2, a series circuit connected to both ends of the first switch circuit S1; and

switching control circuits SC1 and SC2 arranged to alternately turn on and off the first and second switch devices with a period of time during which both switch devices are turned off therebetween.

Claim 39 (new): The switching power supply apparatus according to Claim 38, wherein a second transformer T2 that is different from the transformer T is provided, the second inductor Li includes an input winding of the second transformer T2, and a rectifying circuit Ds2 is provided between an output winding Lo of the second transformer T2 and the rectifying and smoothing circuit RS.

Claim 40 (new): The switching power supply apparatus according to Claim 38, wherein a second transformer T2 that is different from the transformer T is provided, an input winding Li1 of the second transformer T2 is connected in series with the second inductor Li, and a rectifying circuit Ds2 is provided between an output winding Lo of the second transformer T2 and the rectifying and smoothing circuit RS.

Claim 41 (new): The switching power supply apparatus according to Claim 38, wherein the transformer T has a tertiary winding Lt, and the second inductor Li is connected in series with the tertiary winding Lt.

Claim 42 (new): The switching power supply apparatus according to Claim 38, wherein the third capacitor Ca is arranged to cause a harmonic component current to flow, and defines a low-pass filter or a portion of the low-pass filter.

Claim 43 (new): The switching power supply apparatus according to Claim 38, wherein a fourth diode Db is connected between the input-side rectifying circuit Da and the fourth capacitor Ci.

Claim 44 (new): The switching power supply apparatus according to Claim 38, wherein a first end of the second inductor Li is connected to a node between the first

switch circuit S1 and the second switch circuit S2 and a second end of the second inductor Li is connected to the third diode Di, and both ends of the fourth diode Dc are connected to a node between the second switch circuit S2 and the fifth capacitor Cr and the node between the first switch circuit S1 and the second switch circuit S2.

Claim 45 (new): The switching power supply apparatus according to Claim 38, wherein the transformer T includes a plurality of drive windings Lb1 and Lb2, and the switching control circuits SC1 and SC2 drive the first switch device Q1 or the second switch device Q2 using a voltage generated in the drive windings Lb1 and Lb2.

Claim 46 (new): The switching power supply apparatus according to Claim 38, wherein delay circuits DL1 and DL2 including series circuits having resistors Rg1 and Rg2 and capacitors Cg1 and Cg2 are provided between the drive windings Lb1 and Lb2 and control terminals of the first and second switching devices Q1 and Q2, and the switching control circuits SC1 and SC2 turn on the switch devices Q1 and Q2 with a delay after voltages for turning on the switch devices Q1 and Q2 are generated in the drive windings Lb1 and Lb2, respectively.

Claim 47 (new): The switching power supply apparatus according to Claim 46, wherein delay times of the delay circuits DL1 and DL2 are set so that the switch devices Q1 and Q2 are not turned on until the voltages to be applied to both ends of the first and second switch devices Q1 and Q2 are reduced to zero or about zero.

Claim 48 (new): The switching power supply apparatus according to Claim 38, wherein the switching control circuits SC1 and SC2 include a switch device connected to control terminals of the switch devices Q1 and Q2, the switch device being turned on a predetermined time after voltages for turning on the switch devices Q1 and Q2 are generated in the drive windings Lb1 and Lb2, thereby turning off the switch devices Q1 and Q2.

Claim 49 (new): The switching power supply apparatus according to Claim 48, wherein the switch device includes transistors Tr1 and Tr2, and impedance circuits and capacitors Ct1 and Ct2 defining time constant circuits are connected to control terminals of the transistors Tr1 and Tr2, respectively.

Claim 50 (new): The switching power supply apparatus according to Claim 38, wherein the switching control circuits SC1 and SC2 include time constant circuits TC1 and TC2 for turning off the switch devices Q1 and Q2 a certain time after voltages for turning on the switch devices Q1 and Q2a are generated in the drive windings Lb1 and Lb2.

Claim 51 (new): The switching power supply apparatus according to Claim 38, wherein the transformer T has a leakage inductance, and the leakage inductance defines the first inductor Lr.

Claim 52 (new): The switching power supply apparatus according to Claim 38, wherein at least one of the first switch circuit S1 and the second switch circuit S2 includes a field-effect transistor.

Claim 53 (new): The switching power supply apparatus according to Claim 38, wherein the switching control circuits SC1 and SC2 control the on-period of the first switch device Q1 so as to stabilize an output voltage obtained from the rectifying and smoothing circuit RS connected to the secondary winding Ls.

Claim 54 (new): The switching power supply apparatus according to Claim 38, wherein the switching control circuits SC1 and SC2 control the on-period of the second switch device Q2 depending upon the voltage across the fourth capacitor Ci.

Claim 55 (new): The switching power supply apparatus according to Claim 38, wherein the switching control circuits SC1 and SC2 suppress the on-period of the

second switch device Q2 as the voltage across the fourth capacitor Ci increases, and, transition to an intermittent oscillation operation mode in which an oscillation period and a stop period are periodically repeated under a light load or no load, the switching control circuits SC1 and SC2 suppress an increase of the voltage across the fourth capacitor Ci.